CHANUKA ALGAMA

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PROFILE

A highly motivated Computer Science graduate with a keen interest in machine learning and artificial intelligence, with a specific focus on computer vision applications as a paradigm that advances machine's perception of the real world. Passionate about driving advancements in the field and eager to contribute to innovative projects in the industry.

INTERESTS AND SKILLS

- **Primary: Computer Vision, Machine Learning**
- **Other**: Diffusion Modeling, Explainability in Machine Learning, Applied Data-Science Research

EDUCATION

BSc. (Hons) in Computer Science, University of Kelaniya Feb 2019 - Jul 2023

- First Class
- Overall CGPA: 3.73
- Minors: Pure Mathematics, Statistics

RESEARCH & WORKSHOPS

Robust Optical Flow Computation: A Higher Order Differential Approach (Undergraduate Research)

- Primary Focus: Solutions for the challenge of optimal correspondence calculation under conditions of substantial nonlinear motion patterns and vulnerability of the flow constraint to rapid spatial transformations.
- Secondary Focus: Solutions for intricacies that can amplify due to inaccurate approximations inherent in numerical differentiation techniques.

Conversational RAG with Memory-Based Context Enhancement (Research)

- Primary Focus: RAG(Retrieval augmented generation) faces limitations in capturing context and understanding complex queries as the proximity of text chunks in the embedding space does not guarantee a meaningful question-and-answer pair.

ML-Informed Mapping of the Spatial Distribution of Poverty Using Mobile Call Detail Records and Remote Sensing Data: A Case Study in Sri Lanka

- To combat poverty effectively, the project examined the potential of utilizing mobile call detail records and remote sensing data to gain fresh insights into poverty's spatial distribution. It used spatial econometric models, including Spatial Error and Bayesian Geostatistical models, to capture spatial dependencies and identify patterns of poverty.
- Mentor: Dr. Kasun Amarasinghe, Senior Research Scientist at Carnegie Mellon University — Machine Learning and Public Policy.
- Mentor: Jesus Ramos Cardona, Senior Data Analyst at California Policy Lab.

Using Medium Resolution Satellite Imagery and Machine Learning to Redefine Urban Areas in Sri Lanka

- This research introduced an end-to-end open-source pipeline to predict the Built-up (Bu) and Non-Built-up (NBU) areas using satellite band data. Finally, the project provides the code base for implementing the UN-Habitat definition What is a City, to understand the patterns, trends, and boundaries of urbanization.

- Mentor: Dr. Kasun Amarasinghe, Senior Research Scientist at Carnegie Mellon University — Machine Learning and Public Policy.
- Mentor: Jesus Ramos Cardona, Senior Data Analyst at California Policy Lab.

INTERNATIONAL AWARDS

IEEE SA P2834 Student Challenge 2022 - Second Prize Nov 2022
Issued by IEEE SA P2834 Standard for Secure and Trusted Learning Systems *València, Spain*

- Project: ConvAuther - A Conversational AI for Multifactor Authentication
- The competition was supported by the IEEE Standards Association (IEEE SA), Industrial Electronics Society (IES), and Computer Society (CS) which allows students to apply their knowledge in Artificial intelligence, and Programming, for trusted and secure platforms. The competitions were held in three phases, while the top 10 teams that entered the final round were invited to two days of challenge at Universitat Politecnica de Valencia, Spain, the team ConvAuther was able to secured second place.
- Selected Projects and Winners, Working Group

PUBLICATIONS

Robust Optical Flow Computation: A Higher-Order Differential Approach

- Pre-Print: Arxiv 2410.09563
- Currently under review at: VISAPP 2025: International Conference on Computer Vision Theory and Applications.

Enhancing Optical flow for a smoother identification of global motion

- Published in the Proceedings of International Conference on Applied & Pure Sciences (ICAPS 2023)
- Abstract, Proceedings, Conference Home

ML-Informed Mapping of the Spatial Distribution of Poverty Using Mobile Call Detail Records and Remote Sensing Data: A Case Study in Sri Lanka

- Accepted for Poster Presentation: AAAI 2025 AI for Public Policy (Association for the Advancement of Artificial Intelligence)
- Conference Home

Conversational RAG with Memory-Based Context Enhancement

- Published in the Proceedings of International Conference on Innovations in Infobusiness & Technology (ICIIT Conclave 2024)
- Proceedings, Conference Home

Using Medium Resolution Satellite Imagery and Machine Learning to Redefine Urban Areas in Sri Lanka

- Currently under review: Association for the Advancement of Artificial Intelligence (AAAI-25)
- Conference Home

PRE-PRINTS & OTHER PAPERS

A Review on Message Complexity of the Algorithms for Clock Synchronization in Distributed Systems

- Pre-Print: ArXiv 2404.15467

HONOURS AND AWARDS

Dean's List - Faculty of Science, University of Kelaniya Feb 2022
Academic Year: 2018/2019 Awarded for excellence in academic performance

- Dean's List: https://science.kln.ac.lk/media/attachments/2023/05/30/deans-list—ac-yr-2018$_2$019.*pdf*

Dean's List - Faculty of Science, University of Kelaniya Feb 2021
Academic Year: 2017/2018 Awarded for excellence in academic performance

- Dean's List: https://science.kln.ac.lk/media/attachments/2021/03/31/deans-list—academic-year-2017-2018.pdf

MEMBERSHIPS

IEEE SA P2834 Working Group Member (Pending)

- Team members of IEEE P2834 Student Challenge 2022 finalists are agreed upon to be an active member of the working group

EMPLOYMENT HISTORY

Researcher June 2024 - Current
LIRNEasia

Junior Researcher July 2023 - June 2024
LIRNEasia

Data Science Intern Feb 2023 - July 2023
LIRNEasia

- Team: Data, Algorithms and Policy (DAP)
- Current work: Using remote sensing for public policy-related applications, building machine learning datasets at the intersection of climate change and energy.
- Company Website URL: https://lirneasia.net/